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[0001] The present application claims priority from Japanese Patent Application Nos. 2000-337498 filed on November 6, 2000, and 2001-182049 filed on June 15, 2001, the disclosures of which are hereby incorporated by reference herein.

[0002] The present invention relates to apparatus and methods for generating entertainment data to be delivered to entertainment terminal devices; entertainment terminal devices and methods for executing entertainment processes based on entertainment application programs; entertainment systems each made up from an entertainment data generating apparatus, entertainment terminal devices, and a data delivery machine for delivering entertainment data; and storage media storing therein processing programs to be executed on a computer for executing the above-described operations.

[0003] Currently, entertainment systems are known in each of which video game machines are connected through a network with a game server for processing and delivering various data on games, and game players play a video game with their respective video game machines. Such entertainment systems are generally called multiplayer network game systems.

1

server processes data transmitted from each video game machine (such data will be referred to as player data hereinafter) to which the game server is connected through a network, generates data necessary for each video game machine to execute the game (such data will be referred to as game data hereinafter), and then transmits game data generated for the video game machine to each video game machine. Player data to be transmitted from each video game machine to the game server may include the position in the game space of the game character being operated by the player of the video game machine and the operating conditions of the game character. Game data to be transmitted from the game server to each video game machine may include the position of another game character (being operated by the player of another video game machine) existing near the game character of the player of the video game machine and the operating conditions of the other game character.

[0005] As described above, in the conventional multiplayer network game system, the game server generates units of game data specific to the respective video game machines, and transmits each unit of game data to the corresponding video game machine. The game data generating process and transmitting process are therefore very complicated. Particularly in case of a network game in which several thousands or more players are participating, it is difficult for the server machine to transmit game data generated for the player to every other player.

machines are connected with a game server through a network and game data is delivered from the game server to each game machine, such as multiplayer network game systems, wherein the load of processing on the server can be relieved, time lags in transmission of data can be prevented from occurring, and a simplified fee collection system can be realized.

[0009] According to the present invention, entertainment data is delivered to a plurality of entertainment terminal devices with the same contents at the same time through a broadband broadcast communication line. Out of the entertainment data delivered, each entertainment terminal device selects data necessary for the device to execute a predetermined entertainment process. On the basis of the data selected and operation input data obtained from an operation terminal, the entertainment terminal device executes the predetermined entertainment process, and then transmits terminal data generated as a result of the execution of the predetermined entertainment process to a low-speed communication line.

[0010] An apparatus for generating entertainment data receives the terminal data from each of the entertainment terminal devices through the low-speed communication line, and then generates, on the basis of the terminal data from all of the entertainment terminal devices, entertainment data including data necessary for each entertainment terminal device to execute a predetermined entertainment process.

[0011] According to the present invention, entertainment data is delivered to entertainment terminal devices with the same contents at the same time through the broadband broadcast communication line. The entertainment data may be delivered in a scrambled state. In this case, the payment of a predetermined fee may be demanded for descrambling the entertainment data.

[0012] According to the present invention, as described above, entertainment data is delivered to the entertainment terminal devices with the same contents at the same time through the broadband broadcast communication line. Therefore, no time lags occur in transmission of the data to the entertainment terminal devices. Besides, it is not necessary to generate units of entertainment data specific to the respective entertainment terminal devices, and to transmit each unit of entertainment data to the corresponding entertainment terminal device. This can relieve the load of processing.

[0013] Besides, out of the entertainment data delivered, each entertainment terminal device selects data necessary for the device to execute a predetermined entertainment process. Therefore, any entertainment device can execute its predetermined entertainment process according to the present invention.

[0014] Further, when a predetermined fee is imposed upon descrambling the entertainment data, an existing receiving fee collection system of a broadcasting system using scrambled

lines can be used for fee collection without any change. In this case, it is not required to newly establish a fee collection system. The fee collection for delivery of entertainment data can be done in a simple manner.

[0015] Other and further objects and features of the present invention will become obvious upon understanding of the illustrative embodiments about to be described in connection with the accompanying drawings or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employing the invention in practice.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a block diagram schematically showing the construction of a multiplayer network game system according to an embodiment of the present invention;

[0017] FIG. 2 is a flowchart of a procedure for processing game data and player data, and for transmitting/receiving such data in the multiplayer network game system of FIG. 1;

[0018] FIG. 3 is a flowchart of a procedure in the game server to identify a video game machine user and judge as to whether the user may participate in a game;

[0019] FIG. 4 is a flowchart of a game processing routine in the game server to generate game data; and

[0020] FIG. 5 is a flowchart of a procedure in a video game machine to participate in a network game and execute the game.

DETAILED DESCRIPTION

[0021] Hereinafter, an embodiment of the present invention will be described with reference to the accompanying drawings.

[0022] Referring to FIG. 1, a multiplayer network game system according to an embodiment of the present invention can be generally divided into a user terminal system 10 including a video game machine 13 as an entertainment terminal device of a user; a game server 30 for managing multiplayer network games; a CS broadcasting system 60 capable of transmitting broadband broadcast signals in CS (Communication Satellite) communication; a communication satellite 70 for the CS communication; a low-speed communication line at, e.g., about 9800 bps to 64 kbps, such as a general telephone line (in this embodiment, referred to as a telephone line 20 by way of example); and an exclusive or public broadband communication line 40 for connecting between the CS broadcasting system 60 and the game server 30. The low-speed communication line is not limited to a public telephone line, and may also be a mobile communication line such as PHS system or a portable telephone system, or an optical digital communication line such as ISDN. Besides, the broadcast communication is not limited to CS communication, and may also be communication using an analog or digital BS (Broadcasting Satellite) line, an analog or digital ground wave broadcasting line, an analog or digital cable TV broadcasting line, or the like, all of which are broadband communication lines capable of transmitting a large

amount of data to a plurality of terminal devices at the same time. Besides, the CS broadcasting system 60 and the game server 30 may be integrated into a single system.

[0023] The user terminal system 10 includes the above-described video game machine 13 with which the user can play a video game being displayed on a TV monitor 14 through a controller 15, an antenna 11 and a receiver 12 capable of receiving broadband broadcast signals, e.g., CS broadcast signals. The receiver 12 may be a general CS tuner for receiving and demodulating CS broadcast signals transmitted from the communication satellite 70. Besides, the CS tuner can descramble scrambled signals of each predetermined channel to output audio/video signals of CS television broadcasts or data of CS data broadcasts.

[0024] The video game machine 13 is an entertainment machine that has not only a function of executing video games on the basis of various game application programs but also functions for other operations or signal processing based on various other application programs. The video game machine 13 still has functions of connecting with a modem for communication through the telephone line 20, and taking therein audio/video signals of CS television broadcasts and data of CS data broadcasts received through the receiver 12. Each of the above-described application programs can be read out from, e.g., an optical disk or a semiconductor memory, or downloaded through a communication network. The flow of a procedure in

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this video game machine 13 to execute a multiplayer network game will be described later.

[0025] The game server 30 includes an interface (I/F) 31 with the telephone line 20 to which each video game machine 13 is connected; a player management section 32 for managing data of players participating in each multiplayer network game (in practice, data sent from each video game machine); a player database 33 for accumulating various data of the players; a game management section 36 for managing network games; a game database 37 for accumulating data of games; a game processing section 35 for generating game data to be delivered to each video game machine 13, which will be described later; and an interface (I/F) 34 with the exclusive or public broadband communication line 40. The game server 30 can be constituted by a single server machine or several server machines. The flow of a procedure in this game server 30 to execute a multiplayer network game will be described later.

[0026] The CS broadcasting system 60 may have almost the same construction as a general CS broadcasting system, which includes a broadcast program management section 64 for managing broadcast programs; a broadcast program database 65 for accumulating data of broadcast programs; a CSTV customer management section 66 for managing data of customers registered for receiving CS television broadcasts or CS data broadcasts; a customer database 67 for accumulating the customer data; a scrambling section 63 for scrambling broadcast signals for CS

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broadcasting in a predetermined manner; and a transmitter 62 and an antenna 61 for transmitting the scrambled CS broadcast signals to the communication satellite 70. In addition, the CS broadcasting system 60 of this embodiment includes an interface 68 with the exclusive or public broadband communication line 40. The broadcast program database 65 accumulates game data transmitted from the game server 30, as a kind of broadcast program data for CS broadcasting. The broadcast program management section 64 manages game data stored in the broadcast program database 65 to be broadcast using one of the CS data broadcasting channels (e.g., a game channel). In this case, the number of the game channel does not need to be one, and two or more game channels may be used for this purpose. Besides, each game channel may not be exclusive to game data of one game. Game data of two or more games can be transmitted through one channel by time sharing.

[0027] FIG. 2 illustrates the flow of a procedure for processing game data and player data, and for transmitting/receiving such data in the multiplayer network game system of FIG. 1.

[0028] In the network game system of FIG. 1, when multiplayer network games in which a plurality of players are participating are taking place, the game server 30 identifies, in step S1 of FIG. 2, each video game machine 13 that has accessed the game server 30 through the telephone line 20. At this time, in each video game machine 13, the player can select

a game in which he or she intends to participate.

[0029] In the next step S2, the game server 30 processes all player data received through the telephone line 20 from all of the players participating in a multiplayer network game (in practice, from the video game machines 13 of the players) to generate game data in accordance with the player data of all of the players.

[0030] In this embodiment, player data includes the position in the game space of the game character being operated by the player and the operating conditions of the game character, and game data includes the positions of the game characters being operated by all of the players participating in the network game, the positions of other objects, and the operating conditions of them. In the conventional network game system, game data generated and transmitted by the game server gives only information necessary for each player playing the game. For example, the game data includes only the position of another game character existing near the game character being operated by the player of a video game machine, and the operating conditions of the other game character. In contrast, in this embodiment, the game data includes the positions of the game characters being operated by all of the players participating in the network game, and the operating conditions of the game characters. For example, in the case of a role-playing game in which many players participate on a vast map, game data which includes information on movement and position

of the game characters being operated by all of the players is generated as the above-mentioned game data. The game data is delivered to the video game machine of each player participating in the game.

[0031] In the next step S3, the game server 30 transmits the game data for all of the players to the CS broadcasting system 60 through the exclusive or public broadband line 40.

[0032] In the next step S4, the CS broadcasting system 60, having received the game data from the game server 30, broadcasts the game data through, e.g., one CS broadcasting game channel.

[0033] In the next step S5, the receiver 12 of each user terminal system 10 receives the game data through the CS broadcasting game channel, and the video game machine 13 then extracts data necessary for the video game machine 13 to execute the game from the received game data for all of the players.

[0034] In the next step S6, the video game machine 13 transmits player data, which has been changed with the progress of the game, to the game server 30 through the telephone line 20. After this, the flow returns to step S2 to repeat the procedure from step S2 to step S6 until the game ends or the player ends the game.

[0035] FIG. 3 illustrates the flow of a procedure in the game server 30 to identify each video game machine 13 that has accessed the game server 30 through the telephone line 20, and

to determine whether the user of the video game machine 13 may participate in the game requested. This is a detail of the procedure in step S1 of FIG. 2.

[0036] When the game server 30 of FIG. 1 receives an access of a video game machine 13 through the telephone line 20 in step S11, the player management section 32 of the game server 30 refers, in step S12, to player registration data accumulated in the player database 33 to thereby check whether the user of the video game machine 13 has been registered as a regular member.

[0037] In the checking process in step S12, if the player management section 32 determines that the user of the video game machine 13 has not been registered as a regular member, the flow advances to step S13, in which the player management section 32 transmits to the video game machine 13 through the telephone line 20 a message rejecting the access, e.g., a message informing the user that he or she has not yet been registered, together with a message inquiring whether the user wants to be registered.

[0038] When the player management section 32 determines that the user of the video game machine 13 has been registered as a regular member, the flow advances to step S14, in which the player management section 32 transmits to the video game machine 13 through the telephone line 20 a message permitting the user's entry for this network game system. The flow then advances to step S15.

[0039] In step S15, the game management section 36 waits to receive from the user of the video game machine 13 through the telephone line 20 a game designation signal indicating which game the user intends to participate in. When the game management section 36 receives the game designation signal, the flow advances to step S16.

[0040] In step S16, the game management section 36 determines whether the game designated by the user of the video game machine 13 is able to accept a new player. This determination can be made by the maximum number of players who can participate in the game, and current game conditions.

[0041] If the game management section 36 judges, in step S16, that the designated game can not accept any new players at present, the flow advances to step S17, in which the game management section 36 transmits to the video game machine 13 through the telephone line 20 a message asking if the user wants to enter another game, or a message asking the user to wait until the designated game is able to accept a new player.

[0042] When the game management section 36 judges, in step S16, that the designated game can accept the user of the video game machine 13 as a new player, the flow advances to a game processing routine for generating game data shown in FIG. 4, which is executed by the game processing section 35 of the game server 30.

[0043] FIG. 4 illustrates the flow of the game processing routine in the game server 30 to generate game data.

[0044] In step S21, the game processing section 35 receives data from all of the players (all video game machines 13) participating in the game through the telephone line 20.

[0045] In the next step S22, the game processing section 35 makes the game progress in accordance with the data from all of the players. In the next step S23, the game processing section 35 generates game data for all of the players in accordance with the current game conditions, and transmits the game data to the CS broadcasting system 60 through the exclusive or public broadband line 40. The game data contains therein identification data with which each video game machine 13 can identify and select the game characters and objects in the game related to the video game machine 13.

[0046] In the next step S24, the game processing section 35 determines whether the game has ended. If the game has not ended, the game processing section 35 repeats the procedures from step S21 to step S24 until the game ends.

[0047] FIG. 5 illustrates the flow of a procedure in a video game machine 13 to participate in a network game and execute the game. The program for this procedure in the video game machine 13 is contained in a game application program, e.g., downloaded from the game server 30, or delivered or sold with a storage medium such as an optical disk or a semiconductor memory.

[0048] When the user of the video game machine 13 intends to participate in a network game by controlling a controller 15,

[0049] When it receives the reply from the game server 30 permitting entry to the designated game, the video game machine 13 participates in the game, and transmits current player data to the game server 30 through the telephone line 20 in step S33.

[0050] In the next step S34, the video game machine 13 receives data transmitted by broadband CS broadcasting through the communication satellite 70. In the next step S35, the video game machine 13 extracts game data from the above-described received data and further extracts identification data as described above from the game data. On the basis of the extracted identification data, the video game machine 13 selects a game character, object, or the like, operable through the controller 15 of the video game machine 13, and another game character, object, or the like, related to the above game character, object, or the like, e.g., an adjacent game character being operated by another player.

[0051] In the next step S36, the video game machine 13

controls the action and so on of each of the above game characters or the like to execute the game.

[0052] In the next step S37, the video game machine 13 updates its player data in accordance with current game conditions. The flow then returns to step S33, in which the video game machine 13 transmits the updated player data to the game server 30 through the telephone line 20.

[0053] In the multiplayer network game system of this embodiment, game entry fees, game playing fees, or the like, can be collected from the players who participated in a game, by using, e.g., the existing collection system for receiving fees of CS television broadcasts and CS data broadcasts in the CS broadcasting system 60.

[0054] More specifically, in the multiplayer network game system of this embodiment, for example, one of the CS data broadcasting channels is used as a game channel and game data as described above is delivered through the game channel. Such a game channel can be provided as a scrambled toll channel. In this case, the above-described entry fees or the like can be collected as the receiving fees of the toll channel. Alternatively, the game channel may be provided as a free channel. In this case, the above-described entry fees or the like may be collected as part of the total receiving fee for CS data broadcasts of each player.

[0055] In case of collecting the game entry fees or the like by using the receiving fee collection system of CS data

broadcasts as described above, the CSTV customer database 67 of the CS broadcasting system 60 stores therein information on each player (the user of each video game machine 13) as data of a customer who has made a contract for receiving CS broadcasts. The CSTV customer management section 66 manages customers and their receiving fees with such customer data. The CSTV customer management section 66 calculates a receiving fee for the user of each video game machine 13 who received the above-described game channel. The CS broadcasting system 60 then demands the payment of the receiving fee for the game channel from the user of the video game machine 13 and the user pays the receiving fee for the game channel to the CS broadcasting system 60. In this case, the receiving fee for the game channel may include the receiving fee for CS broadcasts actually received, an agent fee for fee collection, etc., in addition to the entry fee for the game in which the user of the video game machine 13 participated.

[0056] On the other hand, in the game server 30, for example, the player management section 32 calculates a game entry fee for each player. The game server 30 then demands the payment of the entry fee from the CS broadcasting system 60. In response to this, the CS broadcasting system 60 pays, to the game server 30, the game entry fee that is calculated by subtracting the receiving fee for CS broadcasts, the agent fee, etc., as described above, from the total receiving fee received from the player.

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[0057] As described above, in the multiplayer network game system in which, e.g., from several hundreds to thousands of players access the game server 30 (constituted by only one server machine or several server machines as a set) to play a network game, up communication from each video game machine 13 to the server machine 30 undertakes only a small amount of data such as player data. In contrast, in down communication from the game server 30 to each video game machine 13, a large amount of data must be transmitted at a high speed. For this reason, in the network game system of this embodiment, an existing low-speed communication line at, e.g., about 9800 bps to 64 kbps, such as the telephone line 20, is used for the up communication from each video game machine 13 to the server machine 30, and an existing broadband communication line such as a digital CS communication line is used for the down communication from the game server 30 to each video game machine 13. Therefore, in this embodiment, multiplayer network games can be realized using existing communication infrastructures.

[0058] In the network game system of this embodiment, the game server 30 generates a single unit of game data in accordance with data of all of the players participating in a network game. The game data is transmitted to all video game machines 13 participating in the game at the same time through a broadband broadcast communication line such as a CS broadcasting line. Therefore, unlike the conventional network

invention defined in the appended claims. The entertainment machine of the present invention is, for example, not limited to the video game machine explained in the embodiment.

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